

DISCUSSION OF THE AMENDMENT

Claims 23 and 24 have been amended by replacing “a polybutadiene, a diolefin elastomer and a copolymer of a monovinylarene with a conjugated diene” with --diene homo- and copolymer elastomers other than the epoxidated elastomer of 1)--, as supported, for example, by original Claim 1 and the specification at page 8, line 11 ff, and by inserting the remainder of the recited definition for epoxidation degree, as supported in the specification at page 3, lines 14-15. No change in claim scope is intended or effected. Remaining amendments correct errors in the claim preambles and/or are otherwise non-substantive.

No new matter is believed to have been added by the above amendment. Claims 16, 18, 19 and 22-34 remain pending in the application.

REMARKS

The rejection of Claims 16, 18, 19 and 22-34 under 35 U.S.C. § 103(a) as unpatentable over EP 654,364 (Holocher-Ertl et al)<sup>1</sup>; US 4,341,672 (Hsieh et al) and US 5,569,690 (Terakawa et al), is respectfully traversed.

As described in the specification beginning at page 1, line 5, numerous studies have been carried out in the prior art with regard to the use of elastomers in the formulation of compounds for tires, and the use of silica as a filler therein. The present invention is drawn to addressing problems associated with the silica filler-containing elastomers of the prior art used for tire treads.

In the present invention, as recited in both independent Claims 23 and 24, silica is present as a filler in a tire tread obtained from an elastomeric composition containing same, wherein the elastomer comprises 20 to 100% by weight of an epoxidated elastomer having an epoxidation degree, defined by the number of moles of epoxidated double bonds with respect to the initial number of moles of diene double bonds, of between 2.27 and 5%.

The Declaration under 37 C.F.R. § 1.132 of named coinventor Gian Tommaso Viola (Viola Declaration), of record, demonstrates superior results for compositions within the epoxidation percent range of the present claims compared to analogous compositions which are outside the epoxidation percent range of the present claims.

The following is excerpted from the previous response, which paraphrases part V of the Viola Declaration:

The data of Tables 1 and 2 should be divided and interpreted as two separate groups, because of the difference in vinyl content of each of the groups and the fact that the vinyl content of the copolymers influences the properties of the copolymers, in particular  $T_g$  and, consequently, dynamic behavior and resistance to abrasion.

$\tan \delta$  1 Hz, 0.1 % strain, 0°C is considered to be a good measurement of the “wet grip” of a tire, while  $\tan \delta$  1 Hz, 5% strain, 60°C is considered to be a good

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<sup>1</sup> Reference to Holocher-Ertl et al in the text is to the English translation thereof, of record, unless otherwise stated.

measurement of the “rolling resistance” of a tire. The ratio  $\text{Tan}\delta$  1 Hz, 0.1% strain, 0°C/  $\text{Tan}\delta$  1 Hz, 5% strain, 60°C is considered to be a significant ratio, because the ratio represents a compromise between “wet grip” and “rolling resistance” and a high value for the ratio indicates optimization of the dynamic performance of the composition making up the tire, assuming the mechanical properties of the tire are the same.

Table 2 shows the above-mentioned ratio as highest at 2.55 for M1-A2, which represents copolymer A2, within the epoxidation percent of the present claims at 5% epoxidation, as compared to M1-A1 at 0.92, which is the unepoxidated reference copolymer, and M1-A3 and M1-A4 at 0.84 and 2.28, respectively, both of which are outside the epoxidation percent of the present claims, copolymer A3 being 0.68% epoxidation and copolymer A4 being 11% epoxidation, the epoxidation percent range of the present claims being 2.27-5.0% epoxidation. Further M1-A2 is superior in minimizing abrasion loss as compared to M1-A1, M1-A3 and M1-A4 and M1-A2 is also superior in not demonstrating too high of a hardness, as compared to M1-A1, M1-A3 and M1-A4. The above results are especially significant between M1-A2, having a 5% epoxidation within the range of the present claims, and having an abrasion loss of 111 and a Shore hardness of 75, as compared to M1-A4, having an 11% epoxidation, outside the range of the present claims and having an abrasion loss of 157 and a Shore hardness of 82.

The comparisons of M1-A5, M1-A6 and M1-A7 demonstrate that M1-A6, which has an epoxidation percent of 2.27 within the range of the present claims, is much better in the above-mentioned ratio than M1-A5, which uses a copolymer with an epoxidation percent of 0 and very close to but slightly less than M1-A7, which uses a copolymer with an epoxidation degree of 14%, outside the range of the present claims. However, M1-A6 is much superior in minimizing abrasion loss, as compared to M1-A5 and M1-A7, and also superior in not demonstrating too high a hardness, as compared to M1-A5 and M1-A7. The results are especially significant, when the abrasion loss of M1-A6 of 146 is compared to the abrasion loss of 210 for M1-A7 and the Shore hardness of M1-A6 of 72 is compared to that M1-A7 of 79. Therefore, it is clear that the comparative data in the Declaration demonstrates superior results for compositions within the epoxidation percent range of the present claims, as compared to compositions of the prior art, which are outside the epoxidation percent range of the present claims.

As discussed in further detail below, the prior art does not suggest the above-recited epoxidation degree range, or the superior results obtained thereby.

In the tire tread composition disclosed by Holocher-Ertl et al, an epoxidized polydiene is used, such as an epoxidized natural rubber, wherein the only epoxidation degree amount disclosed is “at least 20% of Oxiran ..., and particularly of at least 30% of Oxiran, is especially advantageous” (page 5, lines 23-25). Holocher-Ertl et al does not, however,

disclose why it is especially advantageous. Holocher-Ertl et al neither discloses nor suggests the use of a smaller amount of epoxidation degree.

The Examiner appears to concede this deficiency, and thus relies on Hsieh et al and Terakawa et al. Neither of these references remedy Holocher-Ertl et al. Hsieh et al is drawn to sulfur or peroxy cured compositions prepared from epoxidized diene rubbers, wherein the extent of epoxidation, defined as the percentage of originally present olefinically unsaturated sites in the diene rubber which has been converted to oxirane, hydroxyl, and ester groups, is “about 5 to 95 percent, presently preferred about 10 to 50 percent” (column 4, lines 18-23). Terakawa et al is drawn to a rubber composition for a tire tread comprising an epoxidized diene rubber, wherein the content of the epoxy group therein is disclosed as “not particularly limited, but is preferably about 0.1 to 60 epoxy groups to 100 monomer units of the rubber, more preferably 0.5 to 40 epoxy groups, and most preferably 2 to 30 epoxy [groups]” (column 3, lines 9-13).

Hsieh et al and Terakawa et al are essentially irrelevant, because neither reference is concerned with a **silica-containing** elastomer composition. Thus, disclosure of epoxidation degree in elastomer compositions not containing silica is irrelevant. Moreover, even if these references were relevant, they either suggest an epoxidation degree that is either not particularly limited or so broad that there would have been no reason for one skilled in the art to expect any significant differences in results from using differing epoxidation degrees. In addition, Hsieh et al actually prefers an epoxidation degree greater than that recited in the present claims.

In response to the above arguments, the Examiner finds that Holocher-Ertl et al “is not confined to the value of 20% since such an amount is characterized as ‘especially advantageous’ ....” In reply, and as discussed above, Holocher-Ertl et al discloses **no** value

below 20%. Moreover, the term “especially advantageous” would appear to be in connection the disclosure of 30% of Oxiran.

The Examiner finds that it is “unclear whether the minimum of 20% of oxirane groups ... converts to an epoxidation level within the claimed limits.” In reply, Holocher-Ertl et al uses the term “degree of epoxidation” (page 7, line 2). Therefore, in the absence of contradictory disclosure, it must be assumed that Holocher-Ertl et al is using the conventional definition. If Holocher-Ertl et al intended a different definition, then its disclosure is not enabling.

Regarding the Viola Declaration, the Examiner finds that the difference in results shown cannot necessarily be attributed to the differences in epoxidation degree, but may be attributable to differences in vinyl content. In reply, as the data show, for any fixed value of vinyl content, an elastomer with an epoxidation degree within the terms of the present claims is always superior to one with an epoxidation degree outside the terms of the present claims. Thus, M1-A2, with a degree of epoxidation of 5%, is superior to M1-A4, with an epoxidation degree of 11%, which the Examiner characterizes as a “closest prior art” value, although none of the cited prior art appears to exemplify such a low value. Similarly, M1-A6, having an epoxidation degree of 2.27%, is superior to M1-A7, having an epoxidation degree of 14%, which the Examiner also characterizes as a “closest prior art” value, although none of the cited prior art appears to exemplify such a low value. Compare *Ex parte Humber*, 217 USPQ 265 (Bd. Pat. App. & Inter. 1981) (**copy enclosed**) (comparative data showing the claimed chlorine-containing compounds to be unexpected over various (non-prior art) chlorine-containing isomers was accepted as more probative over prior art, drawn to non-chlorine containing analogs of the claimed compounds, asserted to be closest.)

Notwithstanding all of the above arguments, the original German text of Holocher-Ertl et al refers to their inorganic silicon component as “Kieselsäure”, which literally

translates as "silicic acid" (as any German-English dictionary can verify), which term is actually used in the English translation of Holocher-Ertl et al. While Holocher-Ertl et al exemplifies a product known as "Ultrasil VN3", which the Examiner finds is a silica according to Chemical Abstracts, nevertheless, silicic acid is a hydrated form of silica, i.e.,  $\text{SiO}_2 \cdot n\text{H}_2\text{O}$ , which is different from silica *per se*, and would not be expected to be interchangeable therewith in view of the water content. At best, Holocher-Ertl et al would appear to be ambiguous on this issue.

For all the above reasons, it is respectfully requested that the rejection be withdrawn.

The rejection of Claims 16, 18, 19 and 22-34 under 35 U.S.C. § 112, second paragraph, is respectfully traversed. Indeed, the rejection would now appear to be moot in view of the above-discussed amendment. Accordingly, it is respectfully requested that it be withdrawn.

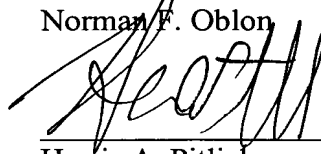
All of the presently-pending claims in this application are now believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

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**FULL TEXT OF CASES (USPQ FIRST SERIES)**

Ex parte Humber, Bruderlein, and Asselin, 217 USPQ 265 (BdPatApp&Int 1981)

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Ex parte Humber, Bruderlein, and Asselin, 217 USPQ 265 (BdPatApp&Int 1981)

## **Ex parte Humber, Bruderlein, and Asselin**

**(BdPatApp&Int)**

**217 USPQ 265**

**Opinion dated Nov. 13, 1981**

**U.S. Patent and Trademark Office, Board of Patent Appeals and Interferences**

### **Headnotes**

#### **PATENTS**

##### **1. Patentability — Composition of matter — (§ 51.30)**

Consistent with *In re Holladay*, 199 USPQ 516, applicants may show improved results for their claimed compounds in comparison with compounds that are even more closely related than those of prior art relied upon by Examiner in order to rebut prima facie case.

##### **Particular patents — Chlorinated Compounds**

Humber, Bruderlein, and Asselin, 13-Chloro-Benzocycloheptapyridoisquinoline Derivatives and Process Therefor, rejection of claims 1-3 and 5-9 reversed.

#### **Case History and Disposition:**

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Appeal from Art Unit 122.

Application for patent of Leslie G. Humber, Francois T. Bruderlein, and Andre A. Asselin, Serial No. 817,660, filed July 21, 1977. From decision rejecting claims 1-3 and 5-9, applicants appeal (Appeal No. 443-29). Reversed.

#### **Attorneys:**

John W. Routh, New York, N.Y., for appellant.

#### **Judge:**

Before Blech and Goldstein, Examiners-in-Chief, and Seidleck, Acting Examiner-in-Chief.

## Opinion Text

### Opinion By:

Blech, Examiner-in-Chief.

This is an appeal from the final rejection of claims 1 through 3 and 5 through 9, all the claims remaining in the case.

Representatives of the claimed invention are:

1. A compound of formula 1

*Tabular, graphic, or textual material set at this point is not available. Please consult hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.*

in which R is lower alkyl selected from the group consisting of straight chain alkyl having up to six carbon atoms and branched chain alkyl having up to four carbon atoms or R is cycloalkyl having 3-6 carbon atoms, or a pharmaceutically acceptable acid addition salt thereof.

5. A method of producing neuroleptic effects in a mammal which comprises administering to said mammal an effective neuroleptic amount of a compound of Claim 1, or a pharmaceutically acceptable salt thereof.

6. A pharmaceutical composition for producing neuroleptic effects in a mammal comprising an effective neuroleptic amount of a compound of Claim 1, or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

The references cited by the Examiner are:

*Table set at this point is not available. See table in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.*

Winthrop et al (Winthrop), J.O.C., 27, pp. 230-240, 1962.

Voith et al (Voith), Psychopharmacologia, 42, pp. 11-20, 1975.

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Humber et al (Humber II), Abstract of Papers, 167th ACS National Meeting, Los Angeles, Calif., March 31-April 5, 1974.

Bruderlein et al (Bruderlein II), J. Med. Chem., Vol. 18, pp. 185-188, 1975.

The appealed claims stand rejected for obviousness under 35 U.S.C. 103. The Examiner considers them to be unpatentable over Voith and Bruderlein II in view of Humber I and Winthrop.

The non-chlorinated analogs of the claimed compounds, specifically also of the preferred species wherein R in the formula above set forth is isopropyl (named "Butaclamol"), are known, as shown by Voith and Bruderlein II. It is the Examiner's position that the claimed 13-Cl substituted derivatives thereof would be prima facie obvious to the artisan in light of the teachings of Humber I and Winthrop and that this presumption of obviousness has not been adequately rebutted by the Declaration evidence.



of record.

We cannot subscribe to the Examiner's holding. It is predicated on the assumption that chlorination, in general, is well known in the pharmaceutical art and since related compounds possessing neuroleptic properties are known to be useful in either their non-chlorinated or chlorinated forms that the claimed compounds are thus obvious. Such an assumption manifestly is bottomed on the proposition that the position in the molecule at which the chlorination occurs is inconsequential and of no significance. But such is contraindicated by the very art relied upon by the Examiner, as well as by the Voith Declaration under 37 CFR 1.132. Thus, from the teaching of Winthrop the artisan would favor the 14-Cl substituted compound inasmuch only its precursor is disclosed to have increased activity. The Voith Declaration, however, convincingly demonstrates unexpectedly significant improved results for the 13-chloro vis-a-vis the 9-Cl, 12-Cl and 14-Cl substituted compounds. Such clearly could not have been foreseen and rebuts the Examiner's basic premise of equivalency of chlorination no matter at which position it is effected.

[1] Of course we appreciate and are cognizant of the Examiner's contention that no improved results have been shown for the claimed chlorinated compounds vis-a-vis the non-chlorinated analog butaclamol. However, consistent with the holding by the court in *In re Holladay*, 584 F.2d 384, 199 USPQ 516 (CCPA 1978), appellants may show improved results for their claimed compounds in comparison with compounds which, in fact, are even closer related than those of the prior art relied upon by the Examiner in order to rebut the prima facie case. Consequently, the comparative showing vis-a-vis the other chlorinated compounds which are more similar to those claimed than the non-chlorinated derivatives is viable probative evidence which palpably must be held as refuting the presumption of obviousness engendered by the art.

Accordingly, the decision of the Examiner is reversed.

*Reversed.*

- End of Case -

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ISSN 1526-8535

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